

REMARKS

Claims 1, 5-7 and 32-52 are pending; claims 39-50 are withdrawn from current consideration. Reconsideration is respectfully requested.

Claim Rejections - 35 U.S.C. § 103

Claims 1, 5-7, 32-34, 51 and 52 are rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over Migowski (WO 89/07836) in view of Bass (US 6,207,887). Applicants traverse.

Claim 1 recites, in part, a method for providing power comprising providing a thermoelectric generator wherein the thermoelectric generator comprises a plurality of thermocouples comprising p-type and n-type thin film semiconductor thermoelements formed on a single flexible substrate, the p-type or the n-type thermoelements having L/A ratios from about 500 cm^{-1} to about $10,000 \text{ cm}^{-1}$.

The Examiner cites *Gardner v. TEC Systems, Inc.*, 725 F.2d 1338, 220 USPQ 777 (Fed. Cir. 1984), cert. denied, 469 U.S. 830, 225 USPQ 232 (1984), as a basis for his rejection that even though Migowski completely fails to teach or suggest the claimed L/A ratio, it nonetheless makes the claimed invention obvious because the L/A ratio is allegedly merely a dimensions design choice. In *Gardner* the Federal Circuit held that,

where the only difference between the prior art and the claims was a recitation of relative dimensions of the claimed device ***and a device having the claimed relative dimensions would not necessarily result in differences in performance over the prior art***, the claimed device was not patentably distinct from the prior art device.

As discussed in detail in the § 1.132 Declaration filed herewith, Applicants illustrate that by varying L/A ratios within the claimed ranges, Applicants' power sources produce up to 70 times the output as directly compared to the Migowski power source, the closest prior art. Applicants illustrate that through varying the L/A ratio within the claimed ranges, Applicants claimed power sources result in a remarkable increase in output *even when otherwise constrained to the same design limits¹ and exposed to the same environmental conditions as disclosed in Migowski*.

Applicants note the following:

- Migowski fails to teach or suggest a power source utilizing the claimed L/A ratios.
- Applicants have provided evidence in § 1.132 Declaration form that the claimed invention has significantly improved performance as directly compared to the Migowski device.²

¹ As the Examiner has acknowledged, Migowski fails to disclose the compositions of his thermoelements and provides no information regarding the Seebeck coefficient of his thermoelement composition. Accordingly, there is no way to know what the Migowski compositions were or what effect, if any, the compositions might have on the Migowski device performance or whether a device was ever made and tested; the reported electric output may be purely theoretical.

² Again, note that because Migowski does not teach what compositions are used for its thermoelements or disclose a Seebeck coefficient for the materials, there cannot be an absolute direct comparison – that is, nothing in Migowski teaches or suggests it uses the compositions of the presently claimed invention.

- Applicants have provided evidence in § 1.132 Declaration form of the criticality of the L/A ratio to the power performance of thin film thermoelectric power sources.
- Applicants have provided evidence in § 1.132 Declaration form of the unexpected nature of the significantly improved performance of the claimed invention.
- Evidence of unexpected results may be in the form of a direct comparison of the claimed invention with the closest prior art that is commensurate in scope with the claims. MPEP § 716.16(b)(III), *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980). A direct comparison to Migowski, commensurate with the scope of the claims, is presented in the § 1.132 Declaration.
- Because the L/A ratio is result effective, the complete failure of the prior art to teach or suggest power sources having the recited L/A ratio, cannot be "excused" based on the allegation that the L/A ratio is a mere dimension limitation (it is noted that the Examiner has not explicitly asserted this basis for rejection). The prior filed Amendment arguments in this regard are re-asserted but not re-iterated herein.
- Although the Examiner has not explicitly assert a "mere optimization" based rejection, Applicants note that because the prior art did not recognize that the L/A ratio is a result-effective variable, Applicants' determination of desirable ranges of the L/A ratio cannot be dismissed as obvious, routine experimentation. The prior filed Amendment arguments in this regard are re-asserted but not re-iterated herein.

In citing the *Gardner* case and putting forth the assertion that it is not necessary for Migowski to teach or suggest the L/A ratio if it is a "dimensions change" the Examiner apparently is relying on the suggestion stated in MPEP § 2144, which instructs that a rejection may be made under § 103 even if the Examiner's rationale to modify the prior art to fit the claimed invention is not stated in the prior art; such a rationale may be based on legal precedent established by prior case law (here, the Examiner suggests *Gardner*). That is, MPEP § 2144, instructs "If the facts in a prior legal decision are sufficiently similar to those in an application under examination, the examiner may use the rationale used by the court."

As the Examiner knows, however, if Applicants have demonstrated the criticality of a specific limitation - here the L/A ratio - it is not appropriate to rely solely on case law as a rationale to support an obviousness rejection. The Second § 1.132 Declaration of John DeSteele filed herewith evidences that the L/A ratio range is critical and produces unexpected superior results. The Second § 1.132 Declaration provides evidence of this criticality by providing a description of precisely what was tested/compared holding both the Examples of the claimed invention and the Migowski disclosed method to identical parameters other than varying the L/A ratio, tabulating the comparison results over the full scope of the claimed range (500 to 10,000 L/A ratio) to the Migowski disclosed power source parameters, and describing exactly how the Example output values were calculated (Migowski discloses an output value of 11 μm).

In addition, the Declaration sets forth the statistical and practical significance of the unexpected superior output values of the claimed method. Applicants note in *In re Waymouth*, 499 F.2d 1273, 1276, 182 USPQ 290, 293 (CCPA 1974), the court held that unexpected results for a claimed range as compared with the range disclosed in the prior art had been shown by a demonstration of "a marked improvement, over the results achieved under other ratios, as to be classified as a difference in kind, rather than one of degree." In addition, as stated in MPEP § 716.01 and in *In re Wagner*, 371 F.2d 877, 884, 152 USPQ 552, 560 (CCPA 1967) the court notes that differences in properties cannot be disregarded on the ground they are differences in degree rather than in kind. Accordingly, the marked improvement of output of the presently claimed power source methods over the prior art – especially the closest prior art, Migowski – evidences unexpected results.³ See also, MPEP § 716.02.

Furthermore, the Examiner's reliance on *Gardner v. Tec Systems, Inc.*, 725 F.2d 1388 (Fed. Cir. 1984) fails to note two important differences between the *Gardner* case as compared to the presently claimed methods and Migowski:

- First, in the *Gardner* case the prior art did not claim specific dimensions - so it was unclear whether the dimensions were different or the same as the patented device. Here, the Migowski reference clearly discloses an L/A ratio far outside the range recited in the method claim; and
- Second, in *Gardner* there was no showing that the contested general dimensions would change the performance of the device. In the current application, however, in addition to the § 1.132 Declaration, Applicants' specification itself (as discussed in Applicants September 2008 Amendment) indicates how the L/A ratio is vital to the performance of the thermoelectric device/method. Specifically, Applicants determined through testing that a key parameter affecting the power produced by the thermoelements is the length-to-area (L/A) ratio of the individual thermoelements. Applicants provide particular L/A ratios so to achieve desired power outputs at large enough voltages to be directly applicable to intended particular devices needing power, without having to provide voltage amplification. This range is tailored for power source methods intended for particular uses needing the particular power output the claimed methods provide. Put another way, the L/A ratios and dimensionalities taught by Applicants critically govern the difference between acceptable and non-acceptable output of a desired method/device.

Because Migowski fails to teach or suggest a device or method within the recited L/A ratio ranges and the § 1.132 Declaration filed herewith evidences both the criticality of the L/A ratio as well as the unexpected nature of the performance of devices and methods within the claimed L/A ratio range, claim 1 is allowable over the art of record.

³ Evidence of unexpected results may be in the form of a direct comparison of the claimed invention with the closest prior art that is commensurate in scope with the claims. See, e.g., *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

Dependent claims 5-7 and 32-34 are allowable for the reasons set forth above and for the reasons set forth in the prior filed Amendments – such arguments are not reiterated herein but continue to be asserted.

Claim 51: Claim 51 is allowable for the same reasons as set forth above in relation to claim 1 and in prior filed responses – such arguments not being reiterated here but continuing to be asserted.

Claim 52: Claim 52 is allowable for the reasons set forth in the prior filed amendments and in prior filed responses – such arguments not being reiterated here but continuing to be asserted.

Claims 35-38 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Migowski and Bass as applied to claims 1, 5-7 and 31-34 above, and further in view of Simeray (US 6,340,787). Applicants traverse.

Claims 35-39 are allowable for the reasons set forth above in relation to claim 1 as Simeray does not make up for the deficiencies of Migowski or Bass. Furthermore, based on arguments presented in previous responses that the prior art is improperly combined, that Migowski teaches away from even considering art from a three-dimensional device (see p. 1, second paragraph), and that the proposed combination ignores the synergistic effect of the claimed method steps, claims 35-39 are allowable over the art of record. The arguments to such effect as set forth in the prior filed amendments are not reiterated herein but continue to be asserted.

Claims 35-39: For the myriad of reasons set forth above, claim 35-39 are allowable over the art of record.

Respectfully submitted,

KLARQUIST SPARKMAN, LLP

By



Lisa M. Caldwell
Registration No. 41,653

One World Trade Center, Suite 1600
121 S.W. Salmon Street
Portland, Oregon 97204
Telephone: (503) 595-5300
Facsimile: (503) 595-5301